MULTIMEDIA UNIVERSITY

MODULE TEST #4

TRIMESTER 1, 2020 / 2021

ECE3296 – DIGITAL IMAGE AND VIDEO PROCESSING
(CE)

22 OCTOBER 2020
2.30 p.m. - 3.30 p.m.
(1 Hour)

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INSTRUCTIONS TO STUDENT

1.   This question paper consists of **2** printed pages with **FOUR** questions only.

2.   Answer **ALL** questions.

3.   Write your answers in the Answer Booklet.

(1) Explain why video broadcasting systems use the YUV color model or its variants instead of other color models.

[5 marks]

(2) Describe the three main analog video standards. Include in your discussion their usage, the field rate and line number per frame, color model and scanning mechanism. Explain why different field rates are used between the standards.

[8 marks]

(3) Video filtering can be classified into one of the three main categories below.

- Intra-frame filtering
- Motion-adaptive filtering
- Motion-compensated filtering

Briefly explain the differences for each of the three video filtering category above.

[7 marks]

(4) An interpolation of two consecutive frames in a frame rate-up conversion algorithm produced the frame in Figure 1.

Figure 1

(i)   In the context of video processing, what is the term used for the artifact produced in Figure 1? In what kind of video does this type of problem persist?

[3 marks]

(ii) Suggest the interpolation method that was used in the up-conversion algorithm to produce this artifact. Justify your answer.

[3 marks]

(iii) Propose a better way to perform frame up-conversion for this kind of video. Explain how your proposed method can eliminate this artifact.

[4 marks]

End of Paper